PATENT
P57003

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

KI-SEON YANG

Serial No.:	*to be assigned*	Examiner:	*to be assigned*
Filed:	16 March 2004	Art Unit:	*to be assigned*

For: CONFIGURING DIRECTION-BASED CORE BASED TREE (CBT) FOR CBT-BASED OVERLAY MULTICAST

INFORMATION DISCLOSURE STATEMENT

Mail Stop Patent Application
Commissioner for Patents
P.O.Box 1450
Alexandria, VA 22313-1450

Sir:

In accordance with 37 C.F.R. §1.56, and §§1.97 and 1.98 as amended, Applicant cites, describes and provides copies of the following art references:

1. U.S. Patent Publication No. 2003/0088696 to McCanne, entitled *PERFORMING MULTICAST COMMUNICATION IN COMPUTER NETWORKS BY USING OVERLAY ROUTING*, published on May 8, 2003;
2. U.S. Patent Publication No. 2003/0195964 to Mane, entitled *MANAGING MULTICAST SESSIONS*, published on October 16, 2003;
3. U.S. Patent Publication No. 2003/0185209 to Lee, entitled *SCALABLE IP MULTICAST WITH EFFICIENT FORWARDING CACHE*, published on October 2, 2003;
4. U.S. Patent Publication No. 2003/0058857 to Maher *et al.*, entitled *MULTICAST IP ZONES FOR FAST SPANNING TREE CONVERGENCE IN WIDE-AREA PACKET*

NETWORK SYSTEMS, published on March 27, 2003;

5. U.S. Patent Publication No. 2003/0005149 to Haas *et al*,. Entitled *INDEPENDENT-TREE AD HOC MULTICAST ROUTING*, published on January 2, 2003;
6. U.S. Patent Publication No. 2002/0091846 to Garcia-Luna-Aceves *et al.*, entitled *TREE-BASED ORDERED MULTICASTING METHOD*, published on July 11, 2002;
7. U.S. Patent Publication No. 2002/0143951 to Khan *et al.*, entitled *METHOD AND SYSTEM FOR MULTICAST TO UNICAST BRIDGING*, published on October 3, 2002;
8. U.S. Patent No. 6,625,773 to Boivie *et al.*, entitled *SYSTEM FOR MULTICAST COMMUNICATIONS IN PACKET SWITCHED NETWORKS*, issued on September 23, 2003;
9. U.S. Patent No. 6,611,528 to Farinacci *et al.*, entitled *HIERARCHICAL ROUTING KNOWLEDGE FOR MULTICAST PACKET ROUTING*, issued on August 26, 2003;
10. U.S. Patent No. 6,321,270 to Crawley, entitled *METHOD AND APPARATUS FOR MULTICAST ROUTING IN A NETWORK*, issued on November 20, 2001;
11. U.S. Patent No. 6,078,590 to Farinacci *et al*, entitled *HIERARCHICAL ROUTING KNOWLEDGE FOR MULTICAST PACKET ROUTING*, issued on June 20, 2000; and
12. U.S. Patent No. 6,611,872 to McCanne, entitled *PERFORMING ,MULTICAST COMMUNICATION IN COMPUTER NETWORKS BY USING OVERLAY ROUTING*, issued on August 26, 2003.

McCanne '696 and '872 relates to an overlay protocol and system for allowing multicast routing in the Internet to be performed at the application level. The overlay protocol uses "native" Internet multicast and multicast routing protocols to route information, according to overlay routing tables. Overlay groups are mapped to native multicast groups to exploit native multicasting in regional or local forwarding domains. Use of the overlay protocol allows overlay distribution to be handled in a more intelligent and bandwidth-managed fashion. Overlay routers are placed at each

of several local area networks, Internet service provider's point of presence, enterprise, or other cohesively-managed locations. The overlay computers are configured according to bandwidth and security policies, and perform application-level multicast distribution across the otherwise disjoint multicast networks by using the overlay routing. The result is an overlay multicast network that is effectively managed according to local network management policies. Application-level control can be applied to the transferred data at the overlay routers.

Mane '964 relates to a method and apparatus to manage multicast communications are described.

Lee '209 relates to a method and apparatus in a multicast transmission system for routing packets including a scalable architecture that supports QoS. Redundant state information is minimized in the MOSPF multicast forwarding cache of each router in the communications system, thereby rendering MOSPF considerably more scalable. In a particular embodiment, cache redundancy is minimized by using a class of graph compression algorithms to solve a graph compression problem. In another embodiment, the forwarding cache is further consolidated by separating state information pertaining to individual source routers in a multicast group from state information pertaining to the entire multicast group.

Maher *et al.* '857 relates to a system and methods for confining multicast routing trees to within single zones of a multi-zone communication systems, thereby enabling faster convergence of the trees relative to trees spanning multiple zones. Separate multicast routing trees are established using different multicast addresses in a source zone and one or more listening zones. Packets for a call distributed by routers (104, 116) of a packet network within the source zone via a source zone multicast address are received by a source zone packet duplicator (132). The source zone packet duplicator forwards the packets, via routers (116, 118, 120, 122) of the packet network using unicast routing, to various listening zone packet duplicators (136, 138). The listening zone packet duplicators, upon receiving the packets, separately distribute the packets within their respective

zones via the packet network using different multicast addresses of the listening zones. The source zone and listening zones may be redefined during the call as the source changes or moves to different zones.

Haas *et al.* '149 relates to a routing protocol for a multicasting network, such as an ad hoc network, which employs alternate tree or path computation algorithms that continually compute backup trees or paths that can be employed to replace failed trees or paths. The sets of alternate multicast trees or paths are preferably pre-calculated before a first tree or path fails to minimize delay in replacing a failed tree or path. Preferably, the algorithms are designed to compute the alternate multicast trees or paths in such a manner that they are maximally independent of the original set of trees and paths to minimize correlation between the original trees or paths and the replacement trees or paths and to possibly increase the useful time of the calculated trees. This helps insure that the replacement trees or paths will not be likely themselves to fail soon after failure of the original trees or paths.

Garcia-Luna-Aceves *et al.* '846 relates to a method for performing end-to-end "tree-based ordered multicasting" (TOM) which ensures collective integrity and consistency of distributed operations, and which is applicable to distributed multiparty collaboration and other multipoint applications. The TOM protocol performs cascaded total ordering of messages among on-tree hosts en route from senders to receivers, and does not require the building of a separate propagation graph to compute ordering information. TOM elects sequencer nodes dynamically based on address extensions of the multicast tree. Message ordering is performed by multicasting a message from each source node to receivers, unicasting a control message from a source node across a primary node to an ordering node for the designated multicast group or transmission in the tree, determining a binding sequence number for the message and a multicast to the receiver group, and delivering messages at end hosts according to the agreed-upon sequence numbers.

Khan *et al.* '951 relates to a method and a system for sending multicast information to a user,

uses agents, network programs, that reside on multicast-enabled computers. The agents receive multicast data packets sent to members of a multicast group. The agents repackage the multicast information into a unicast data packet and forward the unicast data packet to a client registered with the agent. The agent may maintain a list of clients for whom it provides service along with information on the multicast group(s) from which the client wants to receive information. Clients may register with an agent by sending a join message. In one embodiment of the present invention, the join message is sent to a source server, another computer program, that handles the assignment of clients to agents. The source server may maintain and/or generate information concerning client/agent pairings that may be used in the assignment process. For example, a composite distance metric calculating some value such as latency or distance between a client and an agent (a client/agent pair) may be used. In another embodiment of the present invention, the client may register directly with an agent. In this embodiment, the agent to which the client sends the join message to may become the agent providing the multicasting-to-unicast bridging services to the client. In a third embodiment of the present invention, the client may send a join message to an agent, where this first agent may be termed a primary agent. The primary agent may determine the agent responsible for providing service to the client (which may be termed the service provider agent). The primary agent may maintain/or generate client/agent pair information such as the composite distance metric to assist with client/service provider agent pairing. Unlike the source server, in this embodiment one to all of the agents may serve as a primary agent and all the primary agents may also function as service provider agents. The source server, the client(s), and the agent(s) may be distributed over several computer systems connected over a communications network such as the Internet.

Boivie et al. '773 relates to a multicast communication system for small groups, using a protocol to indicate to routers receiving a packet according to the protocol to perform the following process: (1) determining a next hop for each of the destination nodes listed in the packet received; (2) partitioning the destination nodes into groups according to the next hop determined for each destination node in the preceding step; (3) replicating the packet such that there is at least one copy

of the packet for each of the next hops; (4) modifying the list of addresses for the destination nodes such that the list of addresses for each of the next hops includes only the addresses for the destination nodes to be routed in that next hop; and (5) transmitting the modified copies of the packet to the next hops found in the previous steps for routing to the addresses included in each packet.

Farinacci *et al.* '528 and '590 relate to a method and system for multicast packet routing, in which only selected routers in a network subset (in a preferred embodiment, those routers on the border of the domain) maintain routing information external to the network subset, while all other routers in the network subset (non-border routers) maintain only information regarding routing within the network subset, including which border routers are on the path from the multicast source device or to the destination devices. The network subset is preferably a domain or other routing domain. A multicast distribution tree is maintained, using protocol messages which are transmitted from leaf nodes toward a root of the tree, while data packets to be multicast are distributed from the root toward the leaf nodes. In each network subset, such as a routing domain, each multicast packet is associated with a multicast distribution tree. The multicast distribution tree is associated with an upstream border router (UBR) and a set of downstream border routers (DBRs). The UBR and DBRs maintain complete routing information for each multicast source device, while all other routers in the network subset maintain routing information only to the UBR and DBRs. A "JOIN" or "PRUNE" protocol message associates a particular UBR with a particular multicast source device, so that non-border routers within the network subset only have to maintain routing information to border routers, while still being able to correctly maintain a multicast distribution tree rooted at a node outside the network subset.

Crawley '270 relates to a system for controlling a multicast session in a network having multiple network nodes. The system selects one of the network nodes as a control point associated with the multicast session. Identity of the control point is then advertised to all network nodes in a particular area. The control point determines multicast control information for the multicast session. Multicast control information determined by the control point is transmitted to the network nodes

participating in the multicast session. The multicast control information may include network nodes participating in the multicast session, multicast reflection points, or instructions for transmitting multicast data to members of the multicast session. Updating of the multicast control information occurs in response to network changes. The system may provide a secondary control point that maintains a copy of control information associated with the multicast session.

The citation of the foregoing references is not intended to constitute an assertion that other or more relevant art does not exist. Accordingly, the Examiner is requested to make a wide-ranging and thorough search of the relevant art.

No fee is incurred by this Statement.

Respectfully submitted,

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Folio: P57003
Date: 16 March 2004
I.D.: REB/kf

INFORMATION DISCLOSURE STATEMENT PTO-1449 (PAGE 1 OF 1)	SERIAL NUMBER	DOCKET NO. P57003
	APPLICANT KI-SEON YANG	
	FILING DATE 16 March 2004	GROUP 2609

U.S. PATENT DOCUMENTS

EXAMINER	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE
/D.O./	2003/0088696	5/03	McCanne			
/D.O./	2003/0195964	10/03	Mane			
/D.O./	2003/0185209	10/03	Lee			
/D.O./	2003/0058857	3/03	Maher et al.			
/D.O./	2003/0005149	1/03	Haas et al.			
/D.O./	2002/0091846	7/02	Garcia-Luna-Aceves et al.			
/D.O./	2002/0143951	10/02	Khan et al.			
/D.O./	6,625,773	9/03	Boivie et al.			
/D.O./	6,611,528	8/03	Farinacci et al.			
/D.O./	6,321,270	11/01	Crawley			
/D.O./	6,078,590	6/00	Farinacci et al.			
/D.O./	6,611,872	8/03	McCanne			

FOREIGN PATENT DOCUMENTS

	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION YES	TRANSLATION NO

OTHER DOCUMENTS *(Including Author, Title, Date, Pertinent Pages, etc.)*

EXAMINER: /David Oveissi/	DATE CONSIDERED: 08/24/2007

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP §609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.